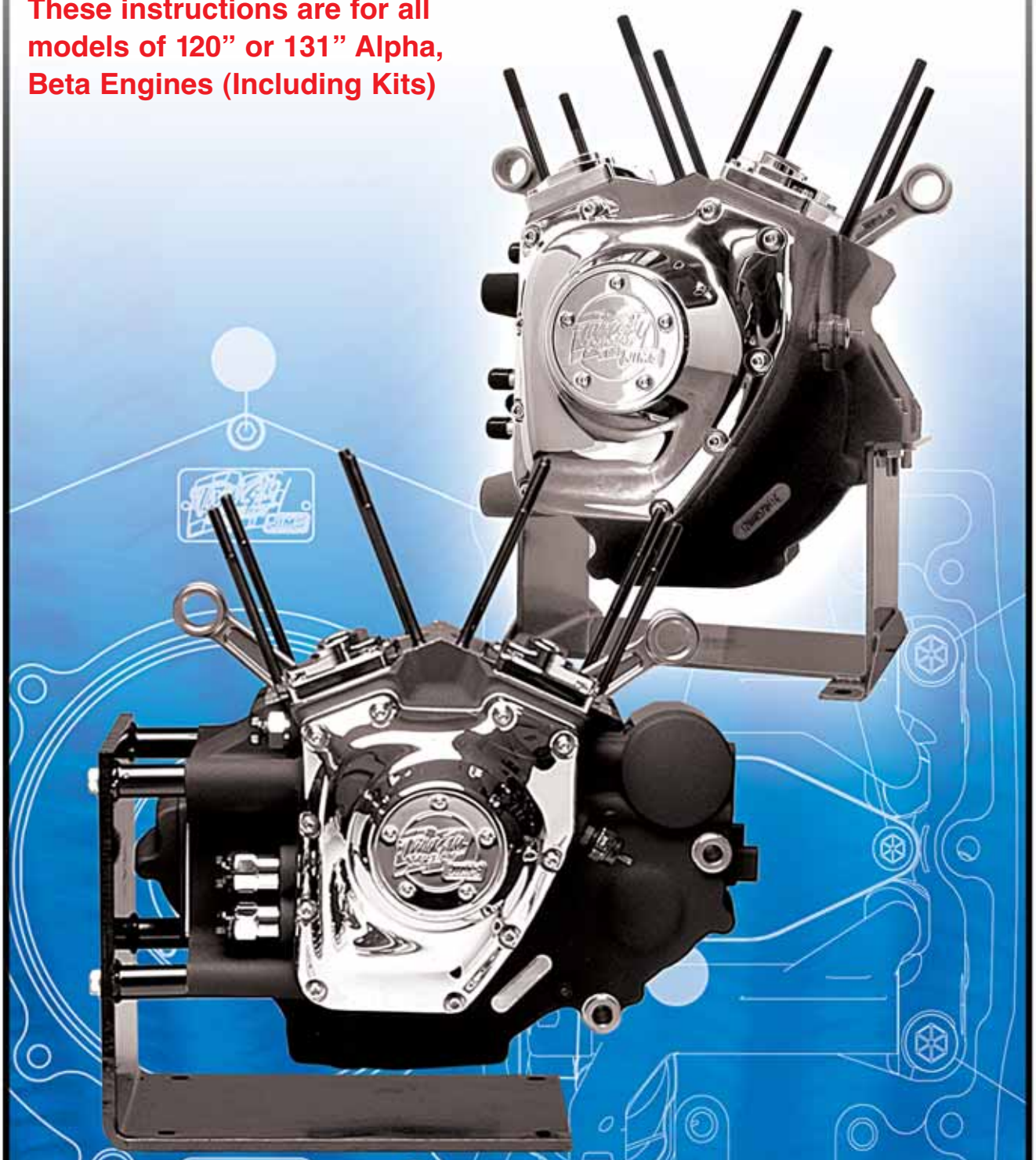
Rev F
6/08

BOX 1 ASSEMBLY INSTRUCTIONS

1208-1351

These instructions are for all models of 120” or 131” Alpha, Beta Engines (Including Kits)



LOWER-END

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

The following instructions are for both 120" or 131" Engine Assemblies" and "Engine Kits", (top end not assembled). These instructions will have information not only for assembly of the engine but will have helpful info in other areas such as: the drive line area, electrical, tuning, oiling, and frame info, etc

Read thoroughly before starting any assembly.

Note: Throughout the following text we will make motor application reference as shown: "A" for Alpha engines; "B" for Beta engines; and "06 FXD" for 2006 to present DYNA™ and 07 FLH for 2007 to present FLH's.

If you ordered and received an assembled engine assembly, we recommend you read all three instruction booklets to become familiar with your new engine. Note that if your engine assembly does not come with a carburetor or ignition. You can order carburetor and ignition separately. Call JIMS® sales department for ordering.

JIMS® 120"Or 131" Kit Engine
General Instructions

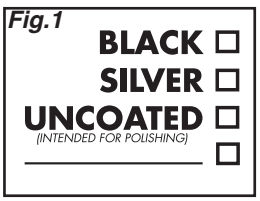
Check Box Contents:

Verify you have received three (3) of three (3) boxes. After inspecting the exterior of the three boxes for damage, proceed to open and examine the contents of each box. Make sure there is no damage and you received the correct version of the JIMS® 120" or 131"" Race Kit. Resist the temptation to open the sealed plastic bags or the Short Block wrapper. This is to keep the parts as clean as possible. Read red tag!

Start with Box One:

Verify the engine case color matches with the checked color on the box, or labels. ***See Fig.1.*** Use the checklist on page 9 and confirm you received everything on the list. Close the box.

Fig.1



Box Two:

Verify that the color of the cylinders and heads match with the checked color on the box label. Use the checklist in box 2 instructions on page 19. Do not unwrap the heads. Do not unwrap the pistons or rings unless you suspect damage. Close the box.

Box Three:

See box label. Use the check list to confirm the contents on page 19. Close the Box.

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Recommended Ignition

1999-03 "A" and 2000-03 "B" models we recommend the Screamin' Eagle® adjustable ignition JIMS® No.1286-1379 or H-D® No.32704-01. On 2004-2006 "A" and "B" models we recommend the Screamin' Eagle® Race Tuner Ignition JIMS® No.1286-1376 or H-D® No.32124-04. These are for carburetor models only and these must be ordered separately.

Recommended Carburetor

It is recommended you use a 51mm CV Screamin' Eagle® carberator JIMS® No.1286-1378, or H-D No.27926-02. You will need to use 2- JIMS No.1286-1400 or H-D® No.26993-06 flanges and 2- No.27035-05 seals. All these parts need to be ordered seperately. See our sales staff for more detailed information.

Assembly Sequence, all Models:

There is nothing particularly difficult about assembly of the JIMS® 120" or 131" Race Kit engine. With some differences, assembly is very much the same as if it were a standard TWIN CAM®. However, because those differences are important, we request you closely follow our assembly instructions. The JIMS® 120" or 131" Race Kit instructions are arranged in a Step-By-Step sequence. Each step builds upon and is dependent upon the previous one. If you follow our instructions, Step-By-Step, you shall assemble your JIMS® 120" or 131" Race Kit engine quickly and correctly.
The details of each step are also important. Please study and follow these step details closely.

NOTE: JIMS® Engines are not equipped for a cam sensor because it is not needed with the recommended ignition module. Disconnect as necessary per bike model shop manual. The pistons and cylinders of the JIMS® 120" or 131" Race Kit are not interchangeable, front to rear, as they are in the stock TWIN CAM® engine. The 120's or 131's cylinder spigot notches are necessary to get the big bore cylinders to clear one another. These notches make the front and rear cylinders different from one another. The rear piston's skirt notch (intake side) is necessary to clear the front piston when both are at the bottom of their stroke (BDC). ***See Fig. 2.***
All gasket surfaces must be perfectly smooth and clean to properly seal the special high performance head and base gaskets.

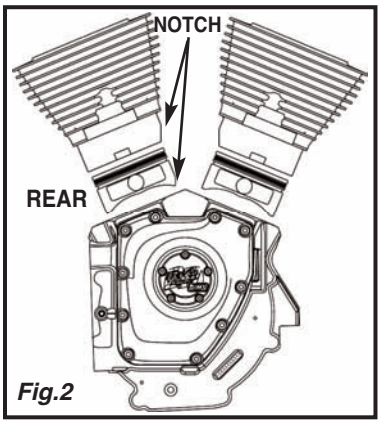

Fig.2

Cleanliness

Your work area must be as clean as possible. From the point of view of engine building, almost all motorcycle shops and private garages are very dirty places. Your JIMS® 120" or 131" Race Kit engine is going to have some of its most highly

Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

loaded parts separated by an oil film only a millionth of an inch thick. If a particle of dirt larger than the oil film gets between those parts, they will be damaged. A particle of sandpaper, in the wrong place, may start a chain of events that can either shorten the wear-life of your new engine or cause it to fail completely. This is not an exaggeration. The greatest single threat to engine life is hard-particle contamination — "dirt".

Modern engines can last a very long time. This is partly due to superior materials, more accurate machining and better lubricants. Still, the most important single factor is cleanliness. Truck engines routinely travel 600,000 miles and many reach a million before they are worn out. There are many EVO and TWIN CAM® Harley® motors having approached or exceeded 200,000 miles of service. None of this could happen if these engines were dirty inside.

Wash and Cover Everything:

Wash your tools. It is not enough to drag a rag through a box-end wrench; wash it inside as well. Soap, water and scrub brushes are not too extreme. When in doubt - clean it. Don't forget your hands. Pictured at right is our "cleanliness block". This block is designed as a reminder to take special care not to introduce dirt or other contamination into your JIMS® 120" or 131" Race Kit. You will find this block located next to the most dirt sensitive assembly instructions. Wash or cover every surface the engine parts may contact. Consider using thin plastic 'drop cloth' material to cover the rest of the bench and surrounding area - especially things like bench grinders. In fact do not assemble your JIMS® 120" or 131" Race Kit in the same room any grinding is performed. Close the door. Turn the fan off if you can stand to. Do not use air pressure to clean anything. Cleaning with air is like blowing leaves; it just moves the stuff around. One of the places an air nozzle moves dirt is into your engine. Do not use it.

Follow all manufacturer's instructions and heed all warnings specific to each chemical used.

The Boxes:

The exterior of the three boxes are going to be contaminated. Keep them away from your work area. Carry the individual sealed packages to your bench before opening them. Do not unseal the packages until you are ready to install or use their contents. Cover with clean plastic or return all parts to their original packaging when you are not working with them.

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

Box One Engine Race Kit
Installation Instructions

Inspection of parts for box 1

Fig.3 - Box 1 components - See Page 9

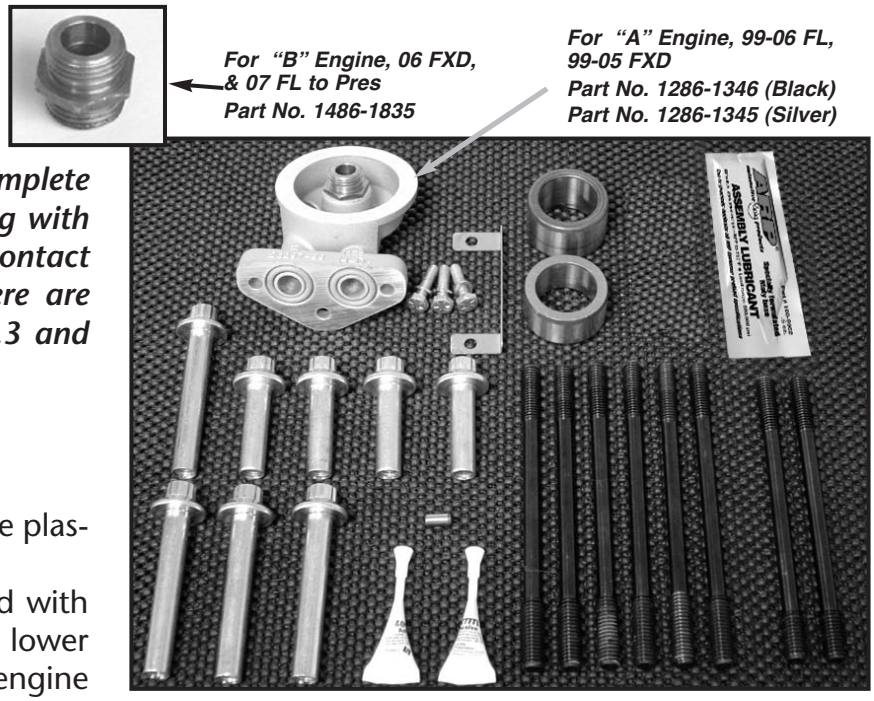

Fig.3 - Box 1 components - See Pages 9

Note: Please verify contents of box 1 and complete inspection of these parts prior to proceeding with installation as listed on page 9. Please contact JIMS® Tech Support (805-482-6913) if there are any issues with the parts enclosed. See Fig.3 and page 4.

Lower End Assembly Inspection

- Read and remove Red Tag attached to the plastic bag containing the lower end.
- Cut open the protective plastic bag, and with the help of a friend carefully remove the lower end from the box and place it into your engine stand.
- Refer to the manufacturer's instructions included with your engine stand for proper installation.
- Replace the blue foam rod protectors into cylinder spigot bore (prevents rod from knocking in case).
- Remove masking intended for cleanliness as indicated.
- Check case finish for scratches may have resulted from shipping.
- Cover lower end assembly with the supplied clean clear plastic bag

Note: Touch-up paint is included in box 2 for your convenience. Please see directions for proper application and curing.

Cylinder Studs

- You will find eight (8) cylinder studs. Two (2) short studs and six (6) long studs.
- Verify presence of green loctite 620 for use when installing the cylinder studs.

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

Oil Filter Mount for Engine "A" 99-06 FL, 99-05 FXD

- Remove from package and inspect for debris and imperfections.
- Verify the package includes three (3) bolts with washers and one (1) locking flange.
- Check that there are two o-rings present.

Tools necessary for box 1 installation: ***See Fig.4***

- ☐ 3/8" drive torque wrench 5-75 ft/lbs
- ☐ 3/8" drive ratchet
- ☐ 1/2" 12 point socket
- ☐ 6" caliper
- ☐ "B" TC Engine Stand, JIMS® No.902
- ☐ Small brass hammer, JIMS® No.1080
- ☐ 3/8" drive torque wrench 40-200 In/lbs
- ☐ 7/8" deep socket
- ☐ 7/16" socket
- ☐ "A" TC Engine Stand, JIMS® No.1022
- ☐ Small brass punch, JIMS® No.1081
- ☐ 20W - 50 clean H-D® engine oil

Recommended Tools & Supplies

- ☐ A small tooth brush
- ☐ Several lint free cloths
- ☐ A flashlight
- ☐ One quart 20W-50 H-D® Motor Oil

Alpha Engine stand shown use on 99'-06' JIMS No.1022

Fig.4 - Tools Required

The following are required to install the cylinder studs:

- ☐ The furnished six long and two short studs.
- ☐ The furnished Loctite compound 620.
- ☐ One (1) furnished cylinder dowel pin tool (1/4" x 1/2")
- ☐ One (1) furnished Short Head bolt
- ☐ A solvent to degrease the threads of each stud. Use Loctite primer, ace tone, denatured alcohol, rubbing alcohol or other non-residue solvent for this purpose.

Beta Engine Stand

JIMS No.902 Use on all Betas

Follow all manufacturer's instructions and heed all warnings specific to each chemical used.

- ☐ A small tooth brush (recommended)
- ☐ A lint-free cloth.
- ☐ A flashlight (recommended)

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

STEP 1: Preparation

- Inspect the entire surface of the studs for damage. ***See Fig.5***
- Minor scratches are okay in the body of the stud.
- The threaded portion of the studs must not have deformities that stud would cause binding between the cases or head bolts.
- Set aside and cover.

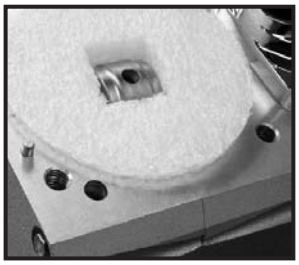

Fig.5- Clean surfaces

STEP 2: Inspect the oil filter o-ring sealing surface

- Sealing surface should be smooth and flat.
- If necessary clean thoroughly, set aside and cover. ***See Fig.8 for Engine "A"***
- Inspect both threads for any burrs or dents on oil filter adapter No.1486-1835.

STEP 3: Base Gasket Surface Preparation

- Clean base gasket surface (case deck) with a clean lint free cloth and (denatured alcohol/isopropyl alcohol)
- Make certain the cylinder seating surfaces of the cases are smooth, clean and dry. ***See Fig. 9.***
- Confirm the eight stud holes in the cases are empty, clean and dry.

Oil Filter Adapter for Engine "B", and "A" - 06-Pres FXD, & 07-Pres FL No.1486-1835

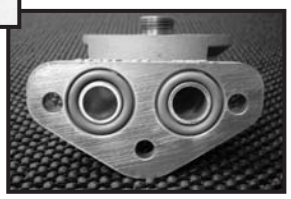

Fig.6 - Oil filter unit

STEP 4: Stud Installation: See Fig.7 & Fig. 8.

Note: These studs are not designed to be an interference fit, however there may be slight drag on some studs as they are installed into the case.

- Each stud is installed with two (2) small drops of Loctite 620 on the first four (4) threads, and (2) small drops in each cylinder stud case hole.

Fig.7- 3/8" Head bolt end

Fig.8- 7/16" Case stud end

Note: Dirt is an engine's worst enemy!

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

IMPORTANT NOTE: Use a head bolt and the furnished cylinder dowel pin to drive the studs.

CAUTION: Loctite 620 sets extremely quick, do not stop until the stud has been installed to the correct height.

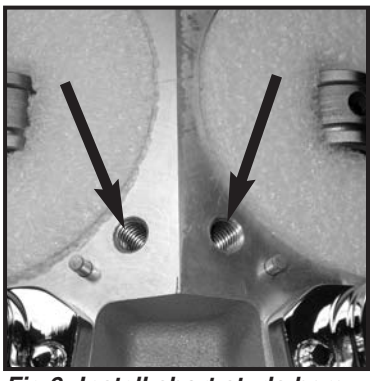

Fig.9- Install short studs here

- Apply a small amount of moly lube, about 1/16" diameter drop, to the 1/4" dowel pin, this will help stop the pin from falling out when removing the head bolt from the stud.
- Install the lubed dowel pin into a short head bolt.
- Set the longer studs out of easy reach while you install the short ones.
- Screw a short stud into the head bolt until stopped by the dowel pin.
- Use this assembly to drive the short studs into the right (cam) side of the engine case. ***See Fig.9.***
- Apply one (1) small drop of Loctite® 620 to the first four (4) threads of one side of the 7/16" case stud threads and then apply one more drop, 180 degrees, on the other side of the stud's first four (4) threads. ***See Fig.10.***
- Apply one (1) small drop of Loctite® 620 to the threads of the center stud holes on the right (cam) side of the case. Then apply a second drop, 180 degrees, on the other side of the same case stud hole. See ***Fig.11.***
- Drive both short studs, as pictured, until the distance measured with your calipers between the case and the bottom of the head bolt is 4.650"+/- .030" above the case deck (gasket surface of the short block). See ***Fig.12.***
- Verify the top of each stud without the head bolt attached should protrude 5.250" +/- .030" from the case deck. See ***Fig.13.***
- Repeat procedure for the remaining 6 long studs.
- Remove any visible Loctite with a clean cloth from gasket surface.

Fig.10 - Apply supplied thread lock

Fig.11- Apply supplied thread lock

Fig.13- Measure stud height

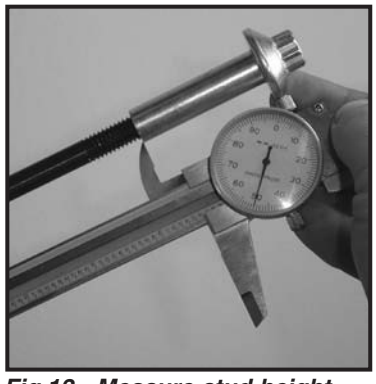

Fig.12 - Measure stud height

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

STEP 5: Oil filter mount installation

- Remove stickers located over 2 holes located where filter mounts to case.
- Refer to the instructions included with your oil filter mount kit for Engine "A" 99-05 FXD, and 99-06 FLH.
- For Engine "B" and 06-Pres.FXD remove 1-7/8 sticker from case where filter mounts. Thread in adapter with lock patch into case with a 7/8" hex socket, torque to 120-168 inch-lbs.

STEP 6: Sprocket shaft spacer installation

- Inspect the engine sprocket shaft, seal and bearing cavities for any packaging debris before continuing. **See *Fig.* 14**
- Locate spacer specific to your application
- Dyna Models 24038-99A "A" for 1999 to 2005
- Softail® Models 24038-99A "B" for 2000
- FL Models 24008-99A "A" & 2006 Dyna™ Models
- Softail® Models 24039-01A "B" for 2001-2006
- Inspect spacer for nicks and dents.
- Lightly coat outside diameter of sprocket shaft spacer and the inside of the sprocket shaft seal with clean 20w-50 H-D® motor oil.
- Slide sprocket shaft spacer onto sprocket shaft, (see illustration) until it is seated on the sprocket shaft bearing. **See *Fig.*15.** If you purchased a complete engine assy, go to page 11 step 11 of the Box 3 Instructions #1208-1353.

Fig.14- Inspect

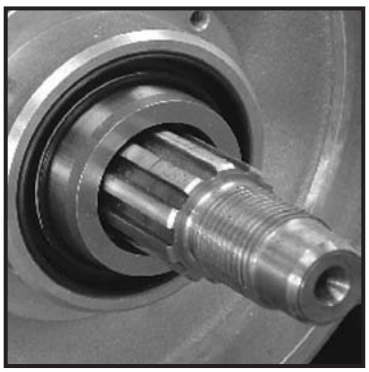

Fig.15- Install spacer

You now have a completed "Short Block."

Cover and seal this assembly with the supplied clear plastic bags. When ready proceed to Box 2 installation instructions.

NOTES

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Instruction Sheet For Box 1 120" Or 131" Engine Assemblies Or Engine Race Kits

BOX 1 Materials Check-Off Sheet

☑	Part No.	H-D® No.	Description	Qty.
☐	1290-1309		120" Lower End Assembly (Black) "A" 1999-Pres. FL, 99-05 FXD	1
☐	1290-1315		120" Lower End Assembly (Sliver) "A" 1999-Pres. FL, 99-05 FXD	1
☐	1390-1309		131" Lower End Assembly (Black) "A" 1999-Pres. FL, 99-05 FXD	1
☐	1390-1315		131" Lower End Assembly (Sliver) "A" 1999-Pres. FL, 99-05 FXD	1
☐	1490-1309		120" Lower End Assembly (Black) "B" 2000-2006 FXST	1
☐	1490-1315		120" Lower End Assembly (Sliver) "B" 2000-2006 FXST	1
☐	1690-1309		120" Lower End Assembly (Black) 06-Pres. FXD, 07 to Pres. FLH	1
☐	1690-1315		120" Lower End Assembly (Sliver) 06-Pres. FXD, 07 to Pres. FLH	1
☐	1708-1309		131" Lower End Assembly (Black) 06-Pres. FXD, 07 to Pres. FLH	1
☐	1708-1315		131" Lower End Assembly (Sliver) 06-Pres. FXD, 07 to Pres. FLH	1
☐	1286-1319	24038-99A	Spacer, Sprocket Shaft "A" 99-05 FXD also "B" 2000 FXST.	1
☐	1486-1834	24039-99A	Spacer, Sprocket shaft "B", 2001-2006 FXST	1
☐	1286-1320	24008-99A	Spacer, Sprocket Shaft "A" 99-Pres. FLH,06-Pres.FXD	1
☐	1286-1346	26261-99	Oil Filler Mount Kit (Black) "A" 99-07 FL, 99-05 FXD	1
☐	1286-1345	26274-99	Oil Filler Mount Kit (Silver) "A" 99-06 FL, 99-05 FXD	1
☐	1486-1835	26352-95A	Adapter, Oil Filler "B" 2000-Pres. FXST, 06-Pres.FXD, 07-Pres.FL	1
☐	1286-1360		Cylinder Stud (Long) "A"& "B"	6
☐	1286-1361		Cylinder Stud (Short) "A",&"B"	2
☐	1286-1362		Retaining Compound #.620 .02oz "A"&"B"	2
☐	1286-1387		Stud Installer Tool "A",& "B"	1
☐	1286-1395		Bag. 24X24 (To Cover Engine"B")	1
☐	1286-1394		Zip Tie, Motor Bagging ,"A",&"B"	1
☐	1208-1302		Red Tag, Shipping "A", & "B"	1
☐	1286-1330		Molly Lube, Package "A",& "B"	1
☐	1286-1331	16478-85A	Screw, Internal Thread, 3-3/16" "A",& "B"	4
☐	1286-1332	16480-92	Screw, Internal Thread, 1-7/8","A",& "B"	4
☐	1208-1304		Warranty Card "A",& "B"	1
☐	1208-1351		Instruction Sheet "A",& "B"	1